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**COMMITTEE OF EXPERTS ON THE TRANSPORT OF  
DANGEROUS GOODS AND ON THE GLOBALLY  
HARMONIZED SYSTEM OF CLASSIFICATION  
AND LABELLING OF CHEMICALS**

Sub-Committee of Experts on the  
Transport of Dangerous Goods

Thirty-fourth session  
Geneva, 1-9 December 2008  
Item 7 of the provisional agenda

**MISCELLANEOUS PROPOSALS OF AMENDMENT TO THE MODEL REGULATIONS  
ON THE TRANSPORT OF DANGEROUS GOODS**

**Impact testing of UN portable tanks and MEGCs, section 41.2  
of the Manual of Tests and Criteria**

**Transmitted by the International Tank Container Organisation (ITCO)<sup>1</sup>**

**Background**

1. The Sub-Committee adopted the current requirements for impact testing of UN portable tanks and MEGCs in 2004 based on a proposal from Canada at its 26<sup>th</sup> session. (see ST/SG/AC.10/C.3/52, para. 104). The impact test protocol has since been successfully used by testing establishments in various parts of the world and has been adopted into the IMDG Code, RID/ADR/ADN and CFR 49.
2. During consideration of the Canadian impact testing proposal at this Sub-Committee in 2004, it was noted that the ISO TC 104/SC2 had been working on standardising the impact test protocol since 1996 and that the work at ISO was continuing. An amendment to ISO 1496-3

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<sup>1</sup> In accordance with the programme of work of the Sub-Committee for 2007-2008 approved by the Committee at its third session (refer to ST/SG/AC.10/C.3/60, para. 100 and ST/SG/AC.10/34, para. 14).

adopting the impact test was finally published in February 2006. However, ISO 1496-3 applies only to portable tanks meeting the definition of container in the International Convention for Safe Containers (CSC) (tank containers) intended for the transport of liquids, liquefied gases and solids (pressurized dry bulk). MEGCs are outside the scope of ISO 1496-3.

3. The test protocol now included in ISO 1496-3 is identical to that adopted by the Manual of Tests and Criteria under the UN Model Regulations on Transport of Dangerous Goods (TDG) in 2004, except for the “permitted design variations” (41.2 of the UN Manual of Tests and Criteria).

4. The impact test prescribed in the Manual of Tests and Criteria is intended to prove that tank containers are able to withstand conditions encountered during transport by rail. The “permitted design variations” define whether or not an impact test conducted in the past on a tank container or MEGC of given design, can be considered valid to support a changed container design. Design variations permitted in this context are those where no significant change in the behaviour of a tank container or MEGC under impact testing is expected. The permitted design variations for tank containers were considered at length at ISO on the basis of the UN Manual for Tests and Criteria and considerable refinements were made.

5. The proposal made below would harmonise the permitted design variations for tank containers in the UN Manual of Tests and Criteria with those now in ISO 1496-3 but make no changes to the existing MEGC permitted design variations.

## **Proposal**

Strike out the existing Section 41.2 in the UN Manual for Tests and Criteria and replace with the following:

### 41.2 Permitted design variations

The following variations in container design from an already tested prototype are permitted without additional testing:

#### 41.2.1 Portable tanks

- (a) A reduction of no more than 10% or an increase of no more than 20% in capacity, resulting from variations in diameter and length;
- (b) A decrease in maximum permissible gross mass;
- (c) An increase in thickness, independent of design pressure and temperature;
- (d) A change to the grade of material of construction provided that the permitted yield strength meets or exceeds that of the tested portable tank;
- (e) A change in location of, or a modification to, nozzles and manways.

41.2.2 MEGCs

- (a) A decrease in the initial maximum design temperature, not affecting thickness;
- (b) An increase in the initial minimum design temperature, not affecting thickness;
- (c) A decrease in the maximum gross mass;
- (d) A reduction in capacity not exceeding 10 % resulting only from variations in diameter or length;
- (e) A change of location or a modification to nozzles and manholes provided that:
  - (i) An equivalent level of protection is maintained; and
  - (ii) The most unfavourable configuration is used for the purpose of the tank strength calculations;
- (f) An increase in the number of baffles and surge plates;
- (g) An increase in wall thickness provided the thickness stays within the range permitted by the welding procedures specifications;
- (h) A decrease of the maximum allowable working pressure, or maximum working pressure, not affecting thickness;
- (i) An increase in the insulation system effectiveness from using:
  - (i) A greater thickness of the same insulating material; or
  - (ii) The same thickness of a different insulating material having better insulation properties;
- (j) A change to the service equipment provided that the untested service equipment:
  - (i) Is located at the same place and meets or exceeds the same performance specification as the existing equipment; and
  - (ii) Is approximately of the same size and mass as the existing equipment; and

- (k) The use of a different grade of the same type of material for the construction of the shell or frame, provided that:
    - (i) The results of the design calculations for the different grade, using the most unfavourable specified values of mechanical properties for that grade, meet or exceed the results of the design calculation for the existing grade; and
    - (ii) The alternate grade is permitted by the welding procedures specifications.
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